

ARS Water Research: From the Headwaters to the Deltas

“We all live downstream.”

It’s a slogan used by cities, states, nonprofit organizations, and a whole host of other groups—even an eco-friendly troupe of musicians called the “Banana Slug String Band.” Here at the USDA Agricultural Research Service, it’s one of the principles guiding our research on how to protect and conserve natural resources, whether they’re downstream, upstream, or right outside the window.

Since water bodies are so varied—low-land ponds, the Great Lakes, highland streams, agricultural ditches, freshwater rivers, saltwater marshes—we use a range of approaches in our work. Some of it is conducted as part of the ARS Conservation Effects Assessment Project (CEAP) Watershed Assessment Study, which involves more than 60 ARS scientists, plus additional technical support staff, working in 14 benchmark watersheds at 12 ARS locations. Our research provides additional scientific bases for the CEAP National Assessment being led by USDA’s Natural Resources Conservation Service (NRCS). Findings from these investigations have been implemented in watersheds in key agro-ecological regions around the nation.

We want our assessments to provide the American people with a better understanding of the role agricultural conservation practices and programs play in achieving the nation’s environmental objectives—clean air and water, healthy soils, and functioning habitat for wildlife. We also

need to have a better understanding of conservation measures that can be used to improve future programs and practices.

Three of our experimental watersheds are in Mississippi. They are all part of the larger Yazoo River Basin, which in turn, is part of the Mississippi River Basin. Studies in these three watersheds help us design management strategies that mitigate runoff of agricultural pollutants from crop fields into the nearest stream or drainage ditch and ultimately into the Mississippi River and the Gulf of Mexico.

A story in this issue of the magazine discusses ARS research along Mississippi’s Coldwater River, a tributary of the silty Yazoo River (story begins on page 4). ARS scientists there are investigating ways of using existing features of the delta landscape to help mitigate pollutant runoff from farm fields. This approach could help farmers reduce levels of nutrients that support hypoxia (low oxygen) in the Gulf of Mexico without sacrificing valuable farmland for riparian buffers or other controls.

Because of findings by ARS scientists, the Coldwater basin is now part of the Mississippi River Basin Healthy Watersheds Initiative. This effort, led by NRCS, supports working with producers and landowners to implement voluntary conservation practices that improve water quality, restore wetlands, enhance wildlife habitat, and sustain agricultural profitability in the Mississippi River Basin.

Additionally, the Lower Mississippi River Basin, where this research was conducted, is one of 18 nationwide locations in the USDA Long-Term Agro-ecosystem Research network. This network addresses large-scale, multi-year research; environmental management testing; and technology transfer related to the nation’s agricultural ecosystems in an assortment of environments—western rangelands, midwestern prairies, the humid Southeast, the temperate Mid-Atlantic—all of which face specific regional issues and challenges linked to agricultural production.

The Mississippi is the longest river in the United States, but we also work on a smaller scale. One prime example of this is found in the sidebar on page 5. It explains that even events that can be detrimental—like flooding—can be good in small doses, when used responsibly.

Water-quality research? We’ve got hip-waders, nets, maps, boats, Global Positioning System technology, sampling equipment, sediment tracers, and a lot of other paraphernalia—and we’re not afraid to use them.

Mark Walbridge

ARS National Program Leader
Water Availability and
Watershed Management
Beltsville, Maryland